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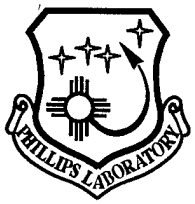
CHRONOLOGY: From the Air Force Geophysics Laboratory to the Geophysics Directorate, Phillips Laboratory, 1985 - 1995

Ruth P. Liebowitz
Evelyn M. Kindler

26 September 1995



PHILLIPS LABORATORY
Directorate of Geophysics
AIR FORCE MATERIEL COMMAND
HANSCOM AFB, MA 01731 - 3010

"This technical report has been reviewed and is approved for publication."

Ruth P. Liebowitz

(Signature)
RUTH P. LIEBOWITZ
Branch Chief

Richard G. Hendl

(Signature)
RICHARD G. HENDL
Chief Scientist
Phillips Laboratory, Geophysics Directorate

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Ruth P. Liebowitz
Evelyn M. Kindler

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This chronology is a continuation of the 1985 report (AFGL-TR-0201, Special Reports, No. 252) published under the title Chronology: From the Cambridge Field Station to the Air Force Geophysics Laboratory, 1945-1985. Together, these two chronologies cover the fifty years of research and development undertaken by the Air Force's Geophysics Directorate since its founding shortly after the end of World War II. As did the earlier chronology, this update lists major organizational developments and events relating to the laboratory's scientific programs. It also includes related illustrations and appendices. The work is intended to provide an updated historical reference for staff at the directorate and at related government agencies.

14. SUBJECT TERMS

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FOREWORD

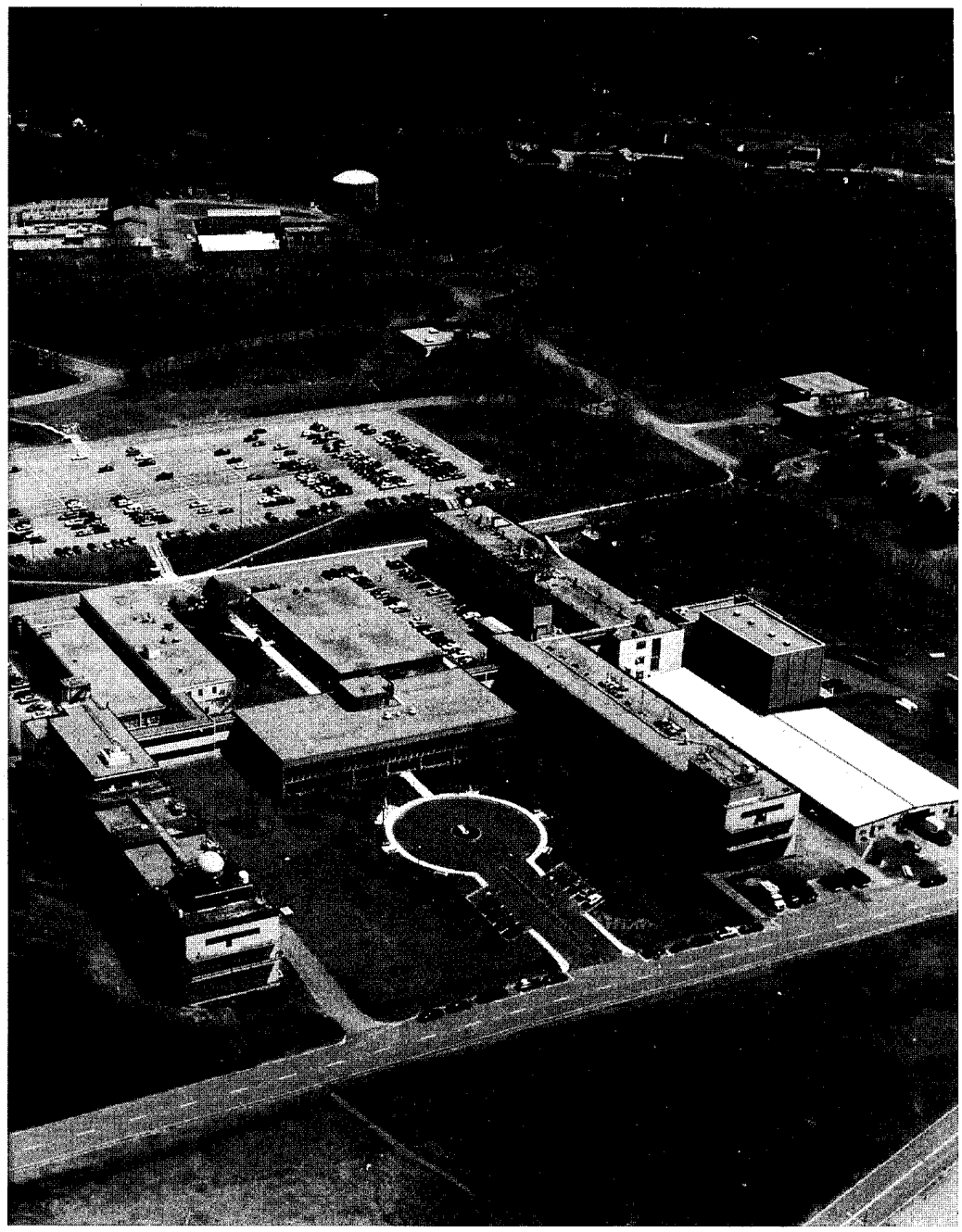
On 14 September 1995 the Geophysics Directorate of Phillips Laboratory celebrated the 50th Anniversary of its founding. This chronology reports organizational events and scientific programs in the directorate during the decade leading up to this golden anniversary year.

This chronology is a continuation of the 1985 report (AFGL-TR-0201, Special Reports, No. 252) published under the title Chronology: From the Cambridge Field Station to the Air Force Geophysics Laboratory, 1945-1985. Together, these two chronologies cover the fifty years of research and development undertaken by the Air Force's Geophysics Directorate since its founding shortly after the end of World War II.

A compilation of this kind is not possible without assistance from many scientists and staff members, both current and retired. Excellent support has been provided by the technical photo and graphics branch. The authors gratefully acknowledge all these contributions to the report.

Hanscom AFB

September 1995



Geophysics Directorate headquarters - 1995

CHRONOLOGY

1985

Jan 24 — The Air Force Space Technology Center (AFSTC) held its first Laboratory Program Management Review (PMR) at Kirtland AFB. AFGL "went first" and briefed both its advanced and exploratory development programs.

Jan 28 — The Balloon Study Committee presented its findings and recommendations to a meeting of the AFGL Corporate Body.

Feb 4-25 — The AFGL KC-135 infrared aircraft flew eleven missions in support of the TEAL RUBY and HI-CAMP Programs.

Mar 10-15 — Pre-launch experiments with the Beam Emission Rocket Test (BERT-1) were carried out in the large vacuum chamber at Johnson Space Center, Houston, TX.

Mar 14 — The Ionospheric Physics Division launched an instrumented rocket from Sondrestrom Air Base, Greenland. Supported by AFGL's Flying Ionospheric Observatory, the rocket-borne payload measured polar cap arcs as part of the Polar Ionospheric Irregularities Experiment (PIIE) Program.

Mar 15 — The MITRE Corporation presented a briefing on its proposed Management Information System (MIS) to the AFGL Corporate Body.

Apr 3-4 — AFGL participated in a joint Air Force/NASA Workshop on the Polar Orbit Environment for EVA (Extra Vehicular Activity) held at NASA's Johnson Space Center.

Apr 5 — The Air Force's Space Division (AFSD) announced that Col Joseph R. Johnson, currently Chief, Strategic Command Control and Communications, HQ USAF/RD, was appointed AFGL Commander to succeed Col Joseph D. Morgan, III, who would be retiring effective 31 July 1985.

Apr 29 — The Defense Mapping Agency (DMA) announced that MSgt Roger W. Sands of the Geodesy and Gravity Branch had won DMA's 1985 R&D Award for work done in the previous year.

Jun 14 — The BERT-1 payload was launched from the White Sands Missile Range, NM, to measure electron beam propagation and vehicle charging.

Jun 17 — The Brazil Equatorial Astronomical Measurements (BEAM) experiment was lost as a result of a rocket mishap during launch from Natal, Brazil.

Jun 27	AFGL made recordings of seismic waves from MINOR SCALE, a simulated, surface, nuclear blast sponsored by the Defense Nuclear Agency (DNA).
Jun 28	A competitive contract was awarded to the RCA Corporation for the development of a LIDAR (Light Detection and Ranging) system to be included aboard the Defense Meteorological Satellite Program (DMSP) Block 5D-3 spacecraft.
Jul 10	AFGL's Research Library Director, Ms. Ruth K. Seidman, was selected as the Air Force's Outstanding Technical Librarian of the year.
Jul 15	It was announced that Dr. George A. Vanasse of the Infrared Physics Branch was the recipient of the 1985 Harold Brown Award.
Jul 16	Colonel Morgan, AFGL Commander, announced the restructuring of computational services at the Laboratory.
Jul 18	A Change of Command Ceremony was held at AFGL with Col John Friel, AFSTC Commander, presiding. Col Joseph R. Johnson took up his station as AFGL Commander.
Jul 29	NASA launched its Spacelab II mission. AFGL participated with other agencies in making solar observations from the Shuttle platform.
Jul 31	Col James K. McDonough, Director of the newly created Geophysics Programs Division, became AFGL's Vice Commander, succeeding the retiring Col Rodney A. Bartholomew.
Jul	The Air Force Systems Command (AFSC) announced Project Forecast II.
Aug 19	The completed and tested Cryogenic Infrared Instrumentation for Shuttle (CIRRIS 1A) payload was delivered to the integration contractor.
Sep 27	The Ground-Based Remote Sensing Branch used its Doppler weather radar to track Hurricane Gloria from south of Long Island up into northern New Hampshire, obtaining a major new data set for hurricane studies.
Oct 5	The second of two successful launches of the Balloon-Borne Ion Mass Spectrometer (BIMS) took place at Holloman AFB. The instrument took measurements of the ion composition of the upper stratosphere (135 thousand feet).
Oct 15	A Cyber 860 went into operation at AFGL replacing the current Cyber 855.

Oct 25 — AFGL's automated digital ionosondes at Argentia NAS, Newfoundland, and at the Goose Bay Ionospheric Observatory were linked up with the Air Force Global Weather Central's SESS Computer.

Nov 17-21 — The Terrestrial Sciences Division shipped its Vibro-Acoustic Measurement System (VAMS) to Vandenberg AFB for installation at the V23 Shuttle launch pad.

Nov 19 — AFGL's HARP (High-Altitude Recovery Payload) System, designed to allow retrieval of high re-entry rocket payloads from the ocean, was tested successfully on a Brazilian Sonda IV launched from Natal, Brazil.

Nov — AFGL published its first Broad Agency Announcement (BAA) in the Commerce Daily Bulletin.

Dec 5 — AFGL's Airborne Ionospheric Observatory provided support to the Electronic Systems Division during tests of the Over-the-Horizon Backscatter Radar in Bermuda.

1986

Jan 12 — The Space Shuttle Columbia carried the Atmospheric Backgrounds Branch's particle analysis cameras as a NASA Hitchhiker payload.

Jan 28 — The Space Shuttle Challenger exploded shortly after take-off from Kennedy Space Center, Florida. The subsequent grounding of the Shuttle fleet delayed the CRRES and CIRRIS 1A Programs and caused the cancellation of other solar/space experiments.

Mar — The Ionospheric Physics Division completed a set of ultraviolet measurements of missile plumes at Vandenberg Air Force Base, CA.

Apr 8 — The rocket-borne SPIRIT I (Spectral Infrared Interferometric Telescope) experiment was successfully launched from Poker Flat Research Range, AK. It obtained new high-resolution spectral data on infrared background radiances at the earth's horizon.

Apr 9-10 — The Critical Design Review for the prototype of the automated Charge Control System (CCS) was completed at the contractor facility, Hughes Research Laboratories, Malibu, CA.

Apr 12 — After an extended "window" with no favorable launch conditions for the payload of the rocket-borne High Resolution Infrared Auroral Measurement (HIRAM) Program, it was shipped to Utah State University for storage until the next winter window opened.

The Geophysics Laboratory made LIDAR measurements in Alaska in 1986. The campaign measured atmospheric density in support of Air Force vehicles making a high-latitude reentry. In the background, the northern lights move across the sky.

Apr 18	The Solar Research Branch at Sacramento Peak Observatory initiated regular forecasts of the speed of solar wind, to be relayed to the AF/NOAA Space Environmental Center at Boulder, CO.
Apr 20	The Aerospace Engineering Division supported the Radar Homing Intercept (SR-HIT) Program at the White Sands Missile Range, NM.
Apr	The Blue Ribbon Commission on Defense Management (the Packard Commission) presented its report to the President.
May	The Atmospheric Sciences Division completed a three-month field program to study weather attenuation of satellite-ground communications.
Jun 23-25	A Critical Design Review for the Air Force Weapons Laboratory's BEAR (Beam Experiments Aboard Rockets) Program was conducted at Albuquerque, NM. AFGL was responsible for payload integration and the Aries vehicle.
Jun	The Earth Sciences Division conducted tests at Fort Devens, MA, which simulated the seismic effects of low-flying cruise missiles on local terrain.
Jun	The Flying Infrared Signature Test Aircraft (FISTA) completed its spring measurements campaign, having taken data on the signatures of cruise missiles and supersonic aircraft.
Jul 11	Lt Gen Forrest S. McCartney, Commander of the Air Force Space Division, dedicated AFGL's newly completed Payload Verification and Integration Facility. This building represented the first major construction at the Laboratory since the completion of the Computation Center (Bldg.. 1107) in 1970.
Jul 19-31	The Solid Earth Geophysics Branch participated in a large cooperative seismic experiment designed to image the crust of northern Nevada, a region proposed for missile basing.
Jul 25	On behalf of AFGL, Col J. R. Johnson, AFGL Commander, accepted the 1986 Aerospace Unit of the Year Award from the Air Force Association Greater Los Angeles Air Power Chapter 147. The award recognized the Laboratory's contribution to the Air Force space mission.
Jul 31	The Secretary of the Air Force announced a Space Recovery Plan. One part of the plan called for the Satellite Launch Complex-6 at Vandenberg AFB, CA, to go into operational caretaker status and not to be used for Shuttle launches until 1992.
Jul	The Optical Physics Division's SCRIBE (Strategic Cryogenic Interferometer Balloon Experiment) payload made high-resolution measurements of minor atmospheric constituents.

Aug 25 — The SPIRIT II (Spatial Infrared Rocket-borne Interferometric Telescope) Request for Proposal was released to industry.

Oct 14 — The 40th Anniversary Dinner took place at the Burlington Marriott Hotel. The featured speaker of the evening was Lt Gen James A. Abrahamson, Director, Strategic Defense Initiative Organization.

Oct 23 — With the acceptance of the cabling, the AFGL Local Area Network (LAN) became fully operational.

Oct — The National Aeronautics and Space Administration ended the grounding of the Shuttle fleet after the Challenger accident and announced a new Shuttle manifest with the first launch scheduled for February 1988.

Nov 13 — The Defense Nuclear Agency's Polar BEAR (Polar Beacon and Auroral Research) satellite was launched. It carried AFGL's Auroral/Ionospheric Remote Sensor (AIRS) on board.

Nov 18 — A party was held at the Officer's Club for Dr. A.T. Stair, who was retiring after a four year stint as AFGL's second Chief Scientist.

Dec — The Space Particle Environment Branch delivered all eighteen SPACERAD sensors for the Combined Release/Radiation Effects Satellite (CRRES) to the integrating contractor, Ball Aerospace Systems Division.

1987

Jan 9 — The new tri-service Military Standard 210-C, "Climatic Information to Determine Design and Test Requirements for Military Systems and Equipment," was published. AFGL's Atmospheric Structure Branch coordinated the technical preparation of this document among the three services.

Jan — The new VAX 8650 computer went on-line in AFGL's central computer facility.

Feb 26 — The Polar ARCS (Acceleration Region and Convection Studies) program, designed to produce improved models of polar cap dynamics, concluded after a successful pair of rocket launches in Greenland.

Mar 4 — The American Defense Preparedness Association presented the Strategic Defense Initiative Laboratory Award to AFGL for the SPIRIT I (Spectral Infrared Interferometric Telescope) Program.

Apr	The testing of the CRRES (Combined Release and Radiation Effects Satellite) spacecraft at Ball Aerospace Division was completed, and preparations were made to store the payload until a new launch schedule was announced.
Apr	A data link was established between AFGL and the CRAY computer at the Air Force Global Weather Central (AFGWC) to enhance Laboratory support for the Air Weather Service.
Apr	AFGL and ESD signed a new Memorandum of Agreement to cover Laboratory support for the Ballistic Missile Early Warning System (BMEWS) Modernization Program.
May	It was announced that AFGL's Vice Commander, Col James K. McDonough, had been reassigned to serve as Director, Space Systems and Activities, at Air Force Space Command. Lt Col John R. Kidd, currently Director, Strategic Defense Initiative Program for the Air Force Space Technology Center, was assigned to be AFGL's new Vice Commander.
Jun 1-5	A Critical Design Review was held for the SDI-sponsored Infrared Background Signature Survey (IBBS) experiment, in which AFGL was a major participant.
Jun 19	The Defense Meteorological Satellite Program (DMSP) launched its F9 satellite from Vandenberg AFB, CA. The spacecraft carried two AFGL-designed sensors for space weather forecasting (the SSJ/4 particle detector and the new SSIES plasma monitor).
Jun	Scientists from the Earth Sciences Division took several measurements of gravity over the entire length of the 562-meter WTVD-TV tower in Clayton, NC, in order to test Newton's Inverse-square law of gravitation.
Jul 31	A ribbon-cutting ceremony was held for the opening of AFGL's modernized R&D Fabrication Center. A newly acquired, computerized milling machine was on display.
Aug 7	A Change of Command Ceremony was held at AFGL with Lt Gen Aloysius G. Casey, Commander, Air Force Space Division, presiding. Col John R. Kidd took up his station as AFGL Commander.
Aug 14	A rocket-borne experiment sponsored jointly by AFGL and the Defense Nuclear Agency employed a new technique for obtaining ion densities in the difficult region between 40 and 80 km.
Aug 18	In a ceremony at the Sacramento Peak Observatory, the facility housing the big dome telescope was dedicated to Dr. John W. Evans, the first director of the Observatory from 1952 to 1974.

Aug 30	The Airborne LIDAR Experiment (ABLE) was launched from Roswell, NM, to measure atmospheric backscatter from a 40 km altitude to simulate space-viewing geometry.
Sep 1	The Secretary of the Air Force announced that the Air Force Space Technology Center (AFSTC) had been awarded the Air Force Organizational Excellence Award for exceptionally meritorious service from 1 January 1985 to 31 December 1986. AFGL, as a subordinate unit of AFSTC, shared in this award.
Sep 1	AFGL began to receive real-time signals of lightning-strike locations over the continental United States as part of a research program to develop automated warning of weather events for air base operations.
Sep 9-10	The Space Physics Division hosted a workshop for participants in the SPEAR I (Space Power Experiments Aboard Rockets) Program, an innovative Science and Technology program in the Strategic Defense Initiative.
Sep 9-10	The Critical Design Review for the EXCEDE III Infrared Interferometer was conducted at the Center for Space Engineering, Logan, UT.
Sep 16-30	AFGL and NASA conducted a joint meteorological field program at Otis AFB, MA. Its purpose was to acquire truth measurements for the Water Vapor Sounder (SSM/T-2) scheduled to fly on DMSP in the early 1990s.
Sep 17	On the 200th Anniversary of the signing of the Constitution, AFGL staff members participated in a reading of the Constitution at Boston City Hall Plaza.
Sep	Gen Bernard Randolph announced plans to streamline Air Force Systems Command Headquarters, including a recommendation to merge Science and Technology with Plans and Programs to form a new Deputy Chief of Staff (DCS) for Technology and Plans.
Oct 1	AFGL delivered the Mark II Comprehensive update to the Air Force's micro-computer Operational Tactical Decision Aid (OTDA) to the Air Weather Service.
Oct 16	The Proton Prediction System (PPS), the first formally-designated technology transition product completed under PE63707F, Environmental Technology Task (ETT), was accepted by Air Force Global Weather Central.
Oct 19	Monthlong chamber experiments for the Artificial Ionospheric Mirror (AIM) Program, a FORECAST II initiative, began at the Lawrence Livermore National Laboratory.

In January 1988 the Geophysics Laboratory successfully launched a gigantic balloon from Antarctica in support of the Gamma Ray Advanced Detector (GRAD) experiment, demonstrating GL's forty-year tradition of leadership in ballooning.

Oct 20-22 The Ionospheric Physics Division hosted a three-day workshop on atmospheric density and aerodynamic drag models for Air Force operations.

Oct The CIRRIS 1A payload--which had been returned from Lockheed, the shuttle integrator, following the Challenger accident--was placed in storage at AFGL's contractor, Utah State University, pending a new shuttle launch date.

Nov 2 The Commander announced that Mr. Brian Sandford, Chief, Airborne Measurements Branch, had been selected as the first recipient of the new AFGL Technology Management Award.

Nov 9-13 The Battan Memorial and Fortieth Anniversary Conference on Radar Meteorology was held in Boston, MA. AFGL's Weather Radar Branch was a major sponsor and participant in the event.

Dec 1 Dr. John F. Paulson received the Harold Brown Award for 1986 for work on wake reduction in reentry vehicles. The ceremony at the Pentagon was hosted by the Secretary of the Air Force and attended by Dr. Brown.

Dec 1-3 A Sensor Integration Workshop Meeting for FORECAST II's Project Technology (PT-12) was held at AFGL.

Dec 13 The SPEAR I rocket-borne payload was successfully launched at NASA Wallops Island Rocket Launch Facility, VA.

Dec 15 AFGL published the first annual documentation of the technology it has transferred to users during the past fiscal year, "AFGL Technology Transition to Users, FY87."

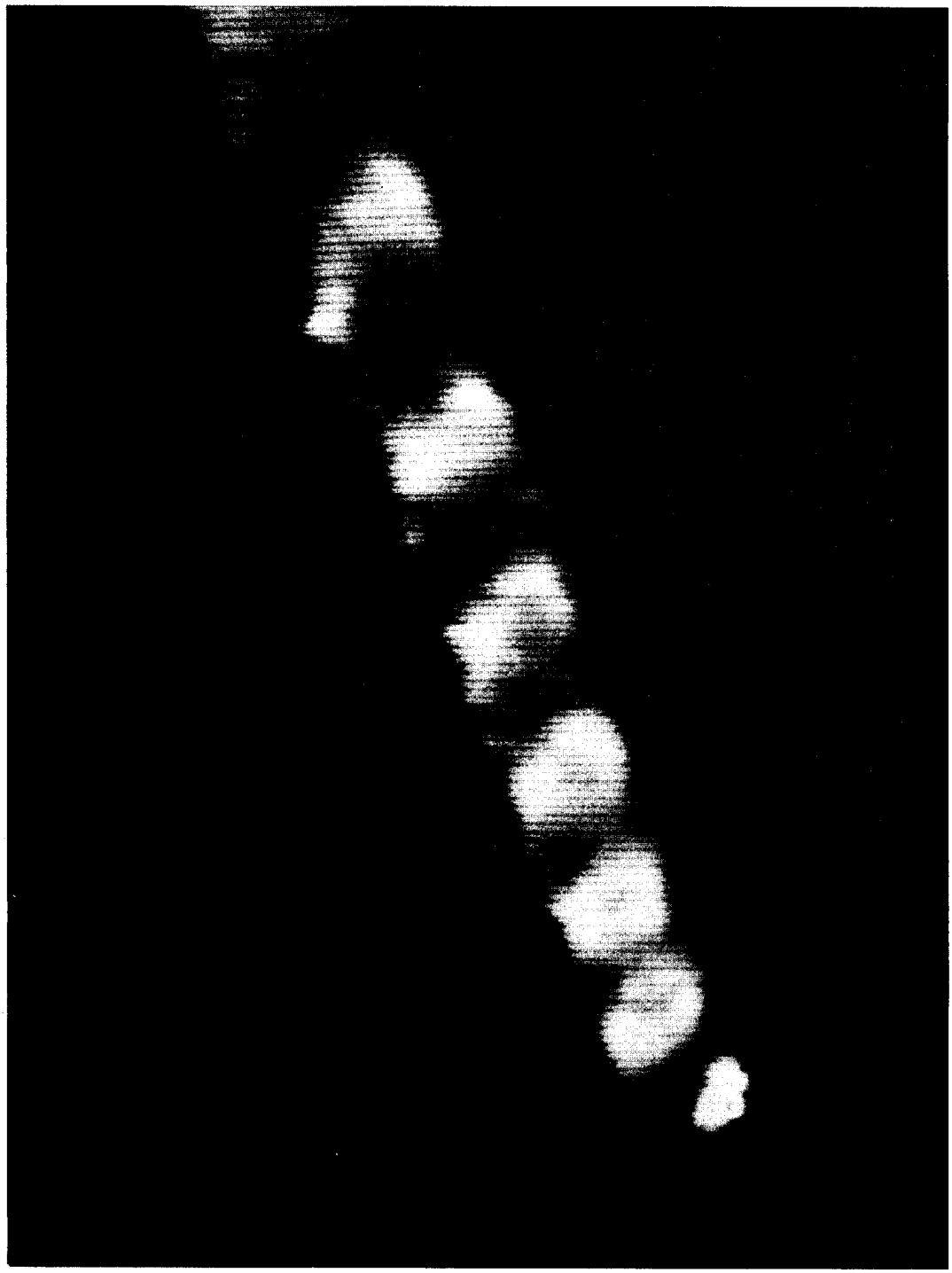
Dec 15-17 A Critical Design Review (CDR) was held at Utah State University for the Spatial Infrared Rocketborne Interferometric Telescope (SPIRIT II) Program.

Dec The Optical Physics Division issued a new Atmospheric Line Parameters Compilation (HITRAN).

1988

Jan 6 AFGL's new toxic chemical dispersion model, AFTOX, was sent to the Air Weather Service. It replaced the currently used Ocean Breeze/Dry Gulch Model, which had been developed at AFCRL 25 years earlier.

Jan 8 The Aerospace Instrumentation Division launched the first large, helium-filled, free balloon ever to be flown in Antarctica in support of the Gamma Ray Advanced Detector (GRAD) experiment.



A TV camera on a free-flying, diagnostic payload caught this picture of the ECHO 7 rocket reentering the atmosphere over Alaska on 8 February 1988. This is the first image of a man-made electron beam being emitted in space.

Jan	Mr. Joseph Hess, AFGL's longtime representative on the West Coast, retired.
Feb 8	The AFGL/NASA/University of Minnesota ECHO-7 rocket experiment was launched from the Poker Flat Research Range, AK, to investigate the propagation of electron beams in space.
Feb 18	The Gravity Gradiometer Survey System (GGSS) hardware, developed by AFGL, was officially delivered by the contractor, Bell Aerospace Textron, to the Defense Mapping Agency.
Feb	The Air Force Space Test Program announced that the CIRRIS 1A experiment was rescheduled for a Shuttle launch on STS-39 in January 1990.
May 14	The Laboratory celebrated the inauguration of its newly completed Science Conference Center with an Open House.
May 17	Dr. Allen G. Rubin, Dr. David L. Cooke, and Mr. Charles P. Pike were presented with a special Award for Technology Transfer from the Federal Laboratory Consortium for transferring their satellite design technology to industry.
May	The Air Force announced that it planned to mothball the Shuttle Launch Complex (SLC) at Vandenberg AFB, CA, and to conduct its Shuttle missions from Cape Canaveral, FL.
Jul 11-15	A Delta Critical Review was held for the reconfigured CRRES satellite, now scheduled to be launched in June 1990 on an Atlas-Centaur rocket.
Aug 17	The Threshold Test Ban Treaty (TTBT) Joint Verification Experiment between the US and the Soviet Union was initiated.
Aug 24-26	Shuttle astronauts visited AFGL to train for flight operations with AFGL's Cryogenic Infrared Radiance Instrumentation for Shuttle (CIRRIS 1A) experiment.
Aug	Representatives from Brazil's Centro Tecnico Aeroespacial (CTA) visited AFGL to discuss rocket-borne experiments.
Sep 1	AFGL's Cooperative R&D Agreement with the ONTAR Corp. to develop and market a PC-version of AFGL's atmospheric transmission code, LOWTRAN-7 (the first CRDA signed by the Air Force) was approved.
Sep 15	The Atmospheric Balloon-borne LIDAR Experiment (ABLE) had a second successful flight over the White Sands Missile Range, NM.
Sep 29	After a 33-month hiatus following the Challenger accident, the Space Shuttle resumed operations with the launch of the Shuttle Discovery.

Sep	The 56 kilobit satellite link from AFGL to the CRAY II at the Air Force Weapons Laboratory, Kirtland AFB, NM, became operational.
Oct 8	Dr. Richard G. Hendl, Director of Technical Plans and Operations, was appointed to be the Laboratory's third Chief Scientist, replacing Dr. A.T. Stair, who had retired in 1986.
Dec	The Space Shuttle STS-27 carried the Air Force Geophysics Laboratory's (AFGL's) hand-held camera for cloud photography. Additional cloud data were obtained on the Shuttle Columbia (STS-28) in August 1989.

1989

Jan	During its second expedition to Antarctica, AFGL tested Pathfinder balloons to gain further knowledge about the Antarctic stratosphere and balloon behavior in that environment.
Jan	Simultaneous satellite and aircraft measurements verified that the Special Sensor for Ions, Electrons, and Scintillation (SSIES) on the Defense Meteorological Satellite Program (DMSP) can identify high-latitude scintillations.
Mar 13-14	As Solar Cycle 22 approached its maximum, solar activity gave rise to a major geomagnetic storm producing radio propagation anomalies, enhancement of the neutral atmospheric density at satellite altitudes, and a major blackout of an electrical power system.
Mar 9	Maj Gen Thomas Brandt, AFSC Chief of Staff, announced some organizational redesignations. The Air Force Geophysics Laboratory was redesignated the Geophysics Laboratory (GL) with AFSC added for identification.
Mar	A GL scientist, Ms. Janet C. Johnston, descended 13,000 feet into a South African gold mine to conduct seismological studies, setting the record for descent into the earth by a woman.
Apr	At the end of a five-year contract, Hughes Research Laboratories delivered a prototype Charge Control System (CCS) to GL.
Apr	GL installed an all-sky imaging photometer at Station Nord, Greenland, to improve coverage of ionospheric disturbances over the polar cap.
Jun 20	The Geophysics Laboratory, together with the Royal Signals and Radar Establishment, began a four-week South Atlantic Backscatter Lidar Experiment (SABLE 89) from Ascension Island. It evaluated aerosols and cirrus clouds as tracers for winds to be measured by satellite-borne lidar.

Jul 13	The Beam Experiment Aboard Rocket (BEAR) was successfully launched on an Aries rocket from the White Sands Missile Range, NM. GL was the system integrator for this neutral particle beam experiment, sponsored by the Strategic Defense Initiative Organization (SDIO), as well as providing the booster and all support systems.
Aug 24	There was a Change of Command Ceremony at the Laboratory. Col Robert J. Hovde assumed command of GL at a ceremony presided over by Col J. R. Johnson, AFSTC Commander.
Aug-Sep	The United States and the USSR conducted a Joint Verification Experiment (JVE) to test verification measures for the Threshold Test Ban Treaty. The first round was held at the Nevada Test Site, 17 August; the second at the Shagan River Test Site, 14 September.
Sep 16	The Flying Infrared Signatures Technology Aircraft (FISTA) obtained high-quality data on an SDIO-sponsored chemical release in the high atmosphere.
Sep	The Airborne Ionospheric Observatory (AIO) flew runs in support of the development, test, and evaluation (DTE) process for the Continental United States (CONUS) over-the-Horizon Backscatter (OTH-B) Radar.
Sep	The Earth Sciences Division signed a Memorandum of Agreement with the Air Force Technical Applications Center (AFTAC) for seismic research in support of nuclear test ban treaties.
Sep	The Laboratory began distribution of the third edition of its Aerospace Environment wall chart.
Oct 3	The USAF/NASA Combined Release/Radiation Effects Satellite (CRRES) underwent thermal vacuum testing at Ball Aerospace Systems Division in Colorado.
Oct	GL delivered the Space Plasma Monitor for the Defense Meteorological Satellite Program (DMSP) S14 spacecraft.
Oct	The EXCEDE III rocket-borne experiment completed sensor integration tests.
Nov 15	The Cryogenic Infrared Radiance Instrumentation for Shuttle (CIRRIS 1A) payload passed its Phase 3 Safety Review.
Nov	The Air Force Systems Command announced that its field units would be taking a 10% cut in personnel over the next three years.
Dec	The Air Force announced a series of actions regarding military personnel which were designed to increase early separations and retirements from the service.

Dec	The T-1 link between the GL Cyber and the CRAY 1 super computer at Air Force Space Technology Center went into operation.

1990

Jan 11	The Secretary of Defense released the Defense Management Report (DMR) spelling out how the Pentagon would fully implement the recommendations of the 1986 Packard Commission. It also instituted a total in-position freeze on civilian hiring.
Jan 12	The Long Duration Experiment Facility (LDEF) was retrieved by the Space Shuttle after five years (instead of the originally planned one year) in orbit. GL had both material and cosmic ray experiments on the LDEF.
Jan	Management and staff members at GL started to attend sessions of Total Quality Management (TQM) Awareness Training.
Jan	As part of the DMR process, the Department of Defense initiated a study on consolidating DoD Laboratories, and the Air Force began a separate set of studies on consolidating AFSC product divisions and laboratories.
Jan-Feb	GL scientists and staff attended two newly established Technology Transition Working Group-Meetings. The first, for lower-atmosphere models, was held on 18 January at the Air Force Global Weather Central (AFGWC). The second, for space-related environment models, was held on 2 February at Colorado Springs, CO.
Feb 26	An Air Force Space Technology Center study was briefed to the GL Corporate Board. It proposed the consolidation and relocation of AFSTC and its subordinate laboratories--Geophysics Laboratory, Weapons Laboratory, and Astronautics Laboratory--at Kirtland AFB, NM, to form a new Space and Missiles Laboratory.
Feb	ESD/PKU announced a set of new procedures to expedite procurement of supplies and equipment at the Laboratory, including Blanket Purchase Agreements.
Mar 18	The Combined Release/Radiation Effects Satellite (CRRES) was shipped from Ball Aerospace Systems Division to Kennedy Space Center.
Apr 27	Shortly before dawn, the EXCEDE III rocket-borne experiment was successfully launched from the White Sands Missile Range, NM. It was designed to simulate, over a limited region, the highly ionized conditions of the upper atmosphere following a nuclear explosion in order to assess whether and how military systems could function in a post-nuclear environment.

CRRES on the launch pad at Cape Canaveral

Jun 11	GL scientists collected the first imagery data of engine firings by a high-altitude Shuttle mission, STS-31, using the AMOS (Air Force Maui Optical Station) Observatory.
Jul 25	The CRRES satellite was successfully launched from Cape Canaveral on an Atlas-Centaur booster into its planned elliptical orbit. Twenty-four hours later, the Air Force's Consolidated Space Test Center (CSTC) at Sunnyvale, CA, began to turn on the sensors for GL's Space Radiation Effects (SPACERAD) experiments on board the satellite.
Sep 14	GL participated in an international stratospheric balloon experiment at Air Sur Ladour, France, contributing its thermosondes to make concurrent measurements of turbulence with ozone and nitric oxide.
Sep 18	The Space Shuttle STS-39 Mission Readiness Review was held at Space Systems Division, Los Angeles, CA. The Geophysics Laboratory had several experiments on both of the two major payloads for STS-39.
Sep 20	The Laboratory celebrated the completion of the temporary (Butler) building, designated 1102E. General Fornell, Commander, Electronic Systems Division (ESD), officiated at the ribbon-cutting ceremony.
Sep	Early in the month the Data Systems Branch shipped the first batch of CRRES data (for orbit #3) to experimenters at 13 agencies.
Oct 4	The Air Force Payload-675 (AFP-675) Experimental Support Structure (ESS) containing CIRRIS 1A and two GL secondary experiments was delivered to Kennedy Space Center for integration into the Space Shuttle STS-39 payload.
Oct 7	GL scientists collected optical imagery and spectra of shuttle engine firings of STS-41 as it passed over the Air Force's Maui Optical Station (AMOS) in Hawaii.
Oct 23-25	The first post-launch CRRES/SPACERAD Science Team Meeting took place at GL. It was attended by over 80 space scientists from the US and Europe.
Oct 26	The Geophysics Laboratory celebrated its forty-fifth anniversary with a dinner at the Hanscom Officers Club.
Nov 27	Col Peter Marchiando gave a briefing on the AFSTC reorganization in the Science Center Auditorium.
Nov 28	The Defense Meteorological Satellite F11 carrying a complement of GL space sensors was launched successfully.
Nov 28-29	The 22nd, and last, Air Weather Service/Geophysics Laboratory (AWS/GL) Forum was held at Hanscom AFB.

Nov — GL's balloon experts flew a Global Position Satellite (GPS) receiver on a high-altitude balloon to test it for use in high-precision measurements of the earth's gravity field.

Dec 13 — The Geophysics Laboratory (GL) was disestablished and reactivated as an Operating Location of the new Phillips Laboratory, one of the Air force's four new "super laboratories" with headquarters at Kirtland AFB, NM,

Dec 19 — Dedication ceremonies for the Phillips Laboratory were held at Kirtland AFB.

1991

Jan 11 — The new Phillips Laboratory issued a memorandum announcing its key personnel assignments.

March — A major solar flare was followed by a large geomagnetic storm that upset the microelectronics of satellites in orbit and knocked out Hydro-Quebec power for nine hours.

Apr 28 — The Space Shuttle Discovery was launched from Cape Canaveral on its STS-39 mission. The AFP-675 on STS-39 carried the Geophysics Directorate's large-scale Cryogenic Infrared Radiance Instrumentation for Shuttle (CIRRIS lA) experiment. The Directorate's Spacecraft Kinetic Infrared Test (SKIRT) flew as a Hitchhiker secondary experiment. Other experiments on board from Phillips Laboratory/Hanscom supported the Infrared Background Signature Survey (IBSS) payload.

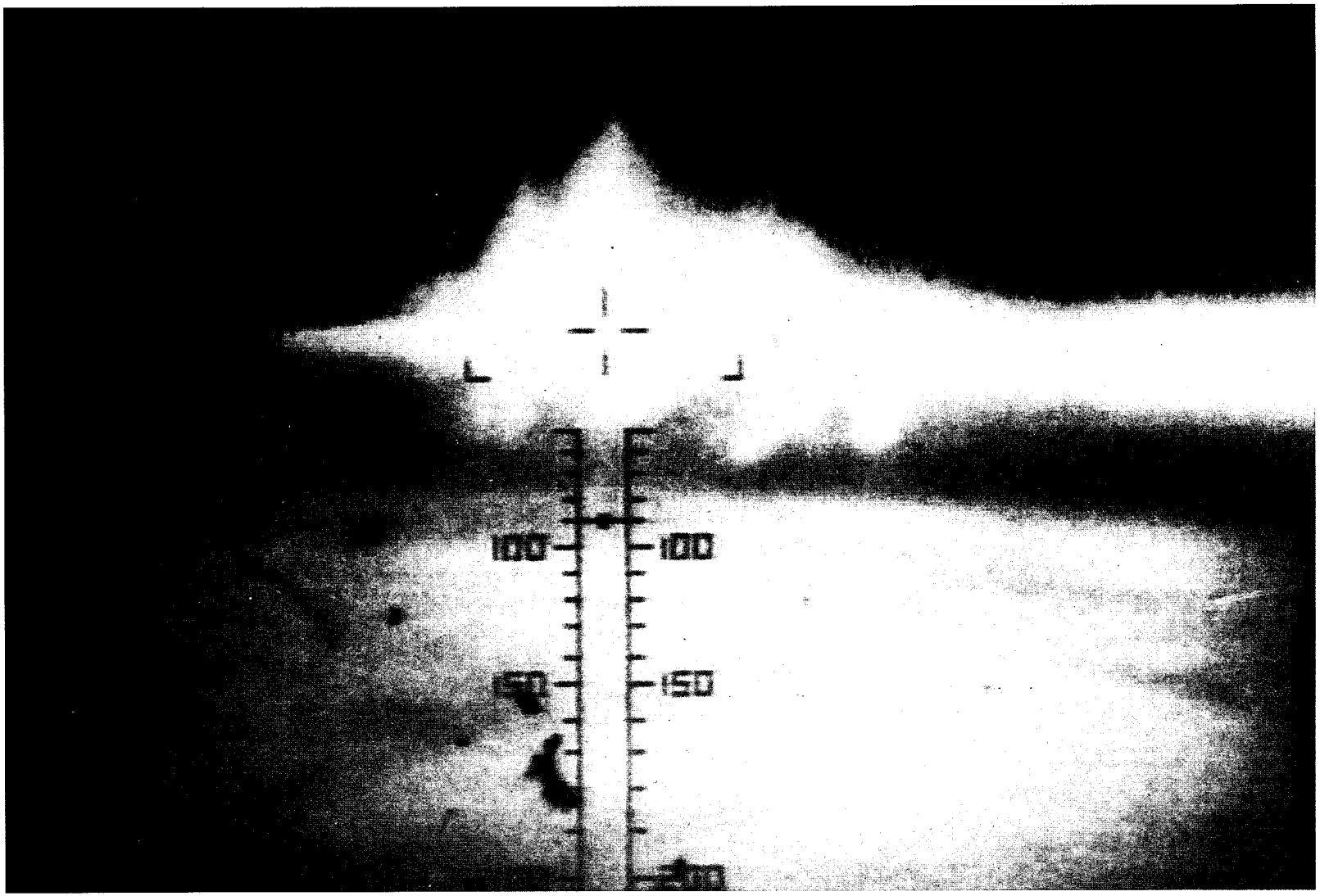
Jul 26 — A Change of Command Ceremony took place at the Directorate. Col Robert J. Hovde retired and his place was taken by a new civilian director, Dr. R. Earl Good, formerly Director of the Optical Environment Division.

Oct 12 — The remaining power supply for the Combined Release/Radiation Effects Satellite (CRRES) failed, terminating the collection of data on the radiation belts by the Space Radiation Effects (SPACERAD) instruments after fourteen months in orbit.

Oct — The Geophysics Directorate began a two-day Offsite Meeting, the outcome of which was the creation of two new GP thrusts, Environmental Quality and Environmental Modeling and Simulation.

Oct — The Secretary of the Air Force asked for briefings to assist his decisions on the physical consolidation of Phillips Laboratory.

Oct — Geophysics Directorate personnel began a major round of PALACE KNIGHT recruiting trips.



CIRRIS 1A's Low-light-level TV camera focuses the infrared sensors on a bright aurora during the STS-39 mission.

Nov 15 — The Department of Defense directed the full implementation of the Tri-Service Reliance process in each of the services. It was to be managed by the Joint Directors of Laboratories working through eleven Technology Panels.

Nov — Work on the planned upgrade for the Solar Electro-Optical Network (SEON) was begun.

Nov — The cover story of the 7 November issue of Nature featured the Critical Ionization Velocity (CIV) experiment. The Hanscom-based Spacecraft Interaction Branch of the Advanced Weapons and Survivability Directorate conducted this experiment on board the Space Shuttle Discovery's STS-39 mission in May 1991.

Nov — During the flight of Space Shuttle STS-44 mission, the Spacecraft Interactions Branch made ground-based observations of the Shuttle's engine firings and a water dump from the Phillips Laboratory AMOS site in Hawaii.

Dec 6 — The Geophysics panel of the Air Force Scientific Advisory Board (SAB) visited the Directorate to review the current (FY-92) Geophysics Technology Area Plan (TAP).

Early in the year a new VAX 9000 and a CONVEX machine were installed as mainline computers at Phillips Lab/Hanscom.

1992

Jan 22 — The Optical Environment Division's VIPER experiment flew on the Space Shuttle's STS-42 mission as a Gas Can "Getaway Special."

Jan 28 — The Directorate conducted its first seminar on sexual harassment.

Jan 29 — The Secretary of the Air Force, Dr. Donald Rice, made an announcement on the physical consolidation of Phillips Laboratory. He announced his decision to consolidate the "split directorates" in the period between fiscal year 1993 and 1995 and his intention to defer a decision on the moves of the Geophysics Directorate from Hanscom AFB and the Propulsion Directorate from Edwards AFB.

Mar 8 — The Spectral/Spatial Infrared Rocketborne Interferometric Telescope (SPIRIT II) experiment was launched from the Poker Flat Research Range, AK, to measure infrared backgrounds under highly disturbed natural conditions--a bright aurora--for theater missile defense.

Jun 18 — NASA approved a reflight of the Optical Environment Division's Spacecraft Kinetic Infrared Test (SKIRT) experiment.

Jun 24-26 Scientists from the Directorate made presentations to the AFSC Laser Mission Study on wind measurements for improving conventional munitions targeting.

Jun 30 The Air Force Systems Command and the Air Force Logistics Command were disestablished and their units merged to form the new Air Force Materiel Command.

Jul 31 The Space Shuttle Atlantis on its STS-46 mission carried two Geophysics Directorate payloads, the Shuttle Potential and Return Electron Experiment (SPREE) and a quadrupole mass spectrometry experiment which measured the incidence of atomic oxygen on the Shuttle's surface.

Sep 1 The Computational Services Division closed down the Cyber mainframe, marking the end of a 22-year era during which the Laboratory had relied on Control Data Corporation mainframes for computing capability.

Sep 2 The Atmospheric Sciences Division inaugurated its new capability to receive weather data in real-time from the Defense Meteorological Satellite Program (DMSP) satellites.

Sep 30 The Space Physics Division released the CRRESRAD model. Based on SPACERAD data, the model predicts the amount of radiation that satellite microelectronics flying at a specified altitude and inclination will receive.

Sep CRRES/SPACERAD experimenters announced that data taken during the great solar disturbances of March 1991 showed the formation of a second inner (proton) belt in the Earth's radiation belts.

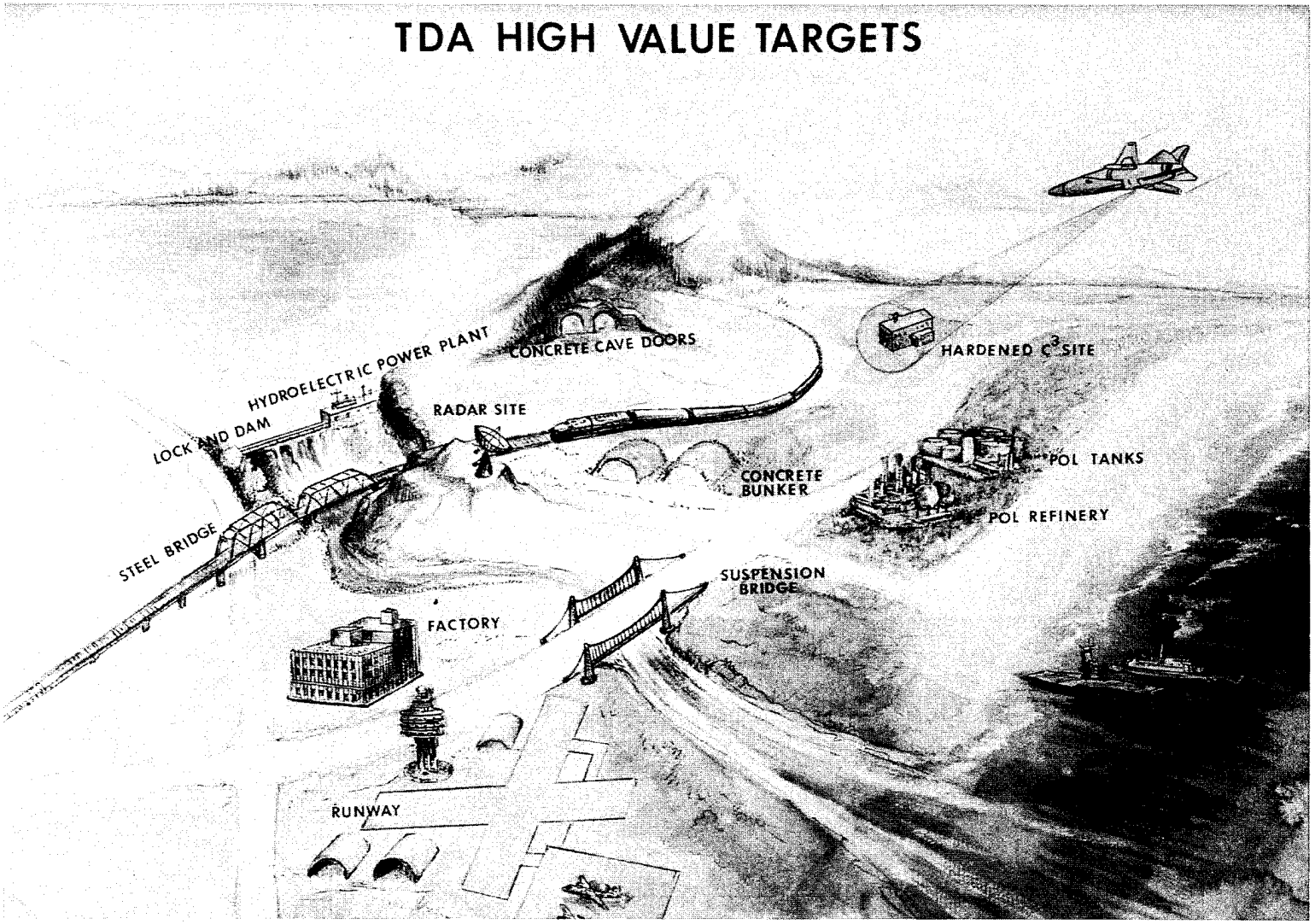
Sep GP's weather radar at Pig Hill in Sudbury, MA, ceased operations, and the equipment was transferred to other organizations.

Dec 2 The Hanscom-located Spacecraft Interaction Branch of the Advanced Weapons and Survivability Division successfully flew the Shuttle Glow Experiment (GLO) on Space Shuttle STS-53.

Dec The Office of Modeling and Simulation (GP-M) reporting directly to the GP Director was established to coordinate the development and marketing of GP's modeling and simulation technology.

1993

Jan The MARK3, version 3.0 of the Electro-Optical Tactical Decision Aid (EOTDA), was issued. It incorporated the Thermal Contrast Model II (TCM II), which modeled "high value" targets.



"High-value" targets with complex heat levels were modeled in the MARK3 version of the EOTDA.

Feb	The reorganization of the Directorate of Operations and Support at Hanscom AFB was officially approved.
Apr 1	Col (Sel) Bruce Smith came on board as Deputy to the Director of the Geophysics Directorate.
Apr	The President's budget proposal for fiscal year 1994 included a section (PBD 755) to cut 10% from the salary line of DoD laboratories and to use the funds for a new ARPA program to support industry-based technology development.
Apr	The Air Force Materiel Command requested authority to enact a reduction-in-force (RIF) to meet the drawdown in the command planned for fiscal year 1994.
May 3	General Yates, AFMC/CC, announced that Dr. R. Earl Good, Director of Geophysics, would replace Mr. James Romero as the Deputy Director of Phillips Laboratory. Dr. Harold Roth of Rome Laboratory's Electromagnetics and Reliability Directorate at Hanscom was named to succeed Dr. Good.
May 27	Phillips Laboratory/Hanscom held a Dining Out. The featured speaker was Col L. Blaine Hammond, Jr., pilot of the Space Shuttle Discovery on the STS-39 mission.
May	Col Peter Marchiando, Commander of Phillips Laboratory, retired. Col Rich Davis, head of the Plans Directorate at Space and Missile Systems Center, was named as his replacement.
May	The Air Force Materiel Command applied for Retirement Incentive and Early Out authorizations to take effect in fiscal 1993 in order to offset a possible RIF required by the Presidential Budget Decision for fiscal year 1994.
Jun	The Air Force announced that SSgt Jeffrey Woffinden of the Geophysics Directorate's Electro-Optical Measuring Branch had been named one of its twelve Airmen of the Year.
Jun 24	Col Rich Davis, future Commander of Phillips Laboratory, held his first meeting with the directors and branch chiefs of PL/Hanscom.
Jul 7	The Change of Command Ceremony took place at Phillips Laboratory, Kirtland AFB, NM, with Brig Gen Tattini, Vice Commander of Space and Missiles Center, presiding. The Command passed from the retiring Colonel Marchiando to Col Rich Davis.
Jul 8	The Civilian Personnel Office at Hanscom announced that it had received authority to offer separation incentives to employees eligible to retire in the Phillips and Rome Labs at Hanscom AFB. The "window" for employees to apply for the incentives opened on 14 July and closed on 31 July.

Aug 4 — The Base Civilian Personnel Office announced that OPM had approved the early-out VERA authority for certain civilian employees at six Air Force bases. Phillips Laboratory employees at Hanscom were given a "window" between 9 and 13 August to apply for option/early retirement and to receive the separation incentive.

Aug 12 — A Change of Director Ceremony took place at the Geophysics Directorate. General Tattini, Vice Commander of Space and Missile Systems Center, and Colonel Davis, Commander of Phillips Laboratory, presided as Dr. Harold Roth took over the post from Dr. R. Earl Good.

Summer — The Computer Division worked to retire the VAX 780 and the VAX 8650 by the end of the fiscal year.

1994

Feb 1 — The first Jerry Beard Memorial Award was presented by the IRIS TBD Specialty Group to Mr. Brian P. Sandford, manager of the FISTA (Flying Infrared Signatures Technology Aircraft) Program.

Feb 3 — The Space Physics Division's Charging Hazards and Wake Studies (CHAWS) experiment was launched on the Space Shuttle (STS-60).

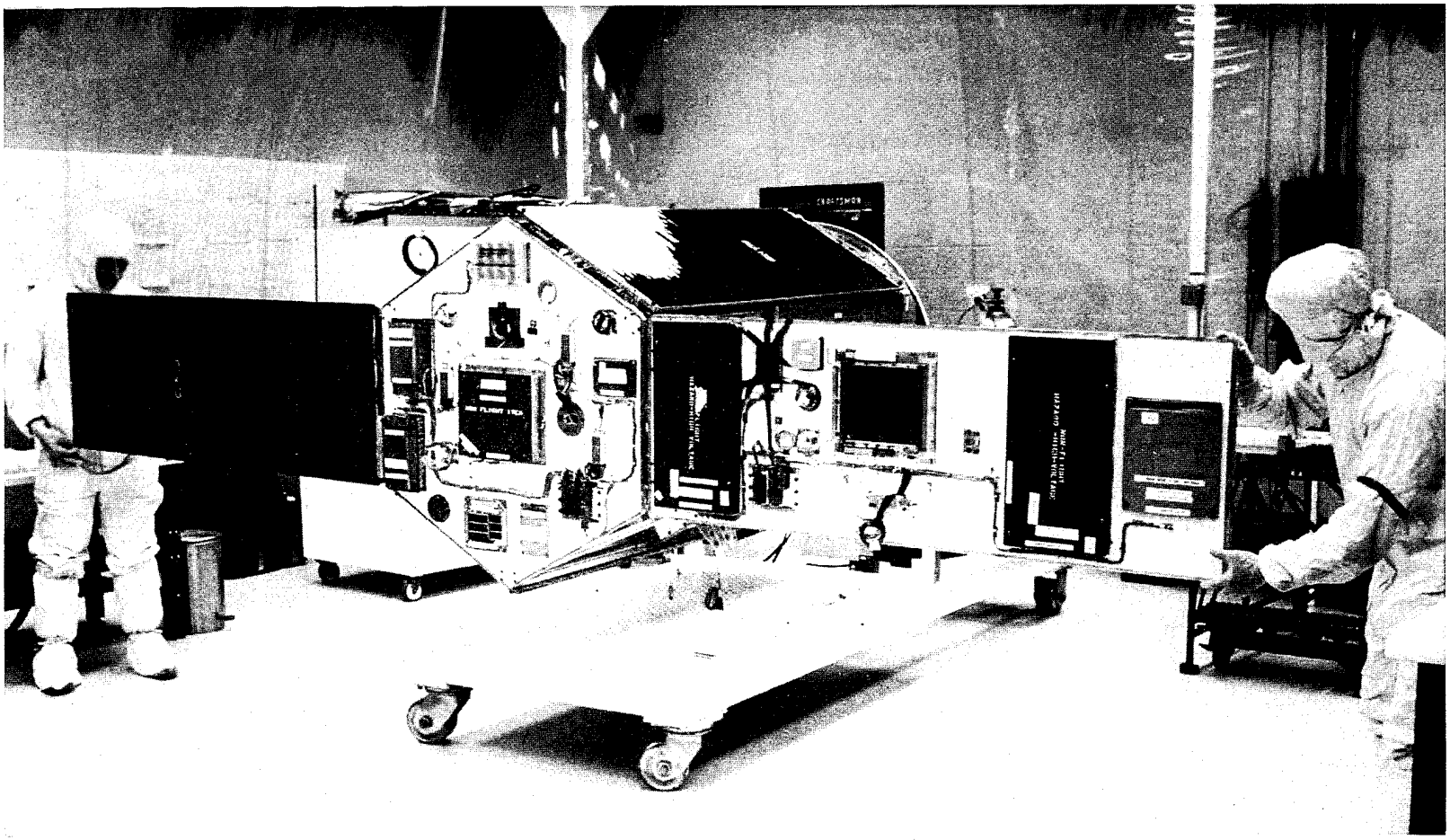
Mar 4 — The Spacecraft Kinetic Infrared Test (SKIRT-2) experiment sponsored by the Optical Environment Division was launched on the Space Shuttle (STS-62).

May 8 — Two divisions of the Geophysics Directorate, Optical Environment and Data Analysis, participated in the MSTI-2 mission launched by the Ballistic Missile Defense Organization.

May 25 — The Director of Defense Research and Engineering directed the secretaries of the military departments to maintain DoD investment in each of the S&T categories at zero percent growth.

May — The PL/GP Advanced Weather System Program Office (PE 63707F) transitioned EOTDA v3.1 to Air Weather Service. This marked the transition of the highly successful EOTDA program which started in the early 80s.

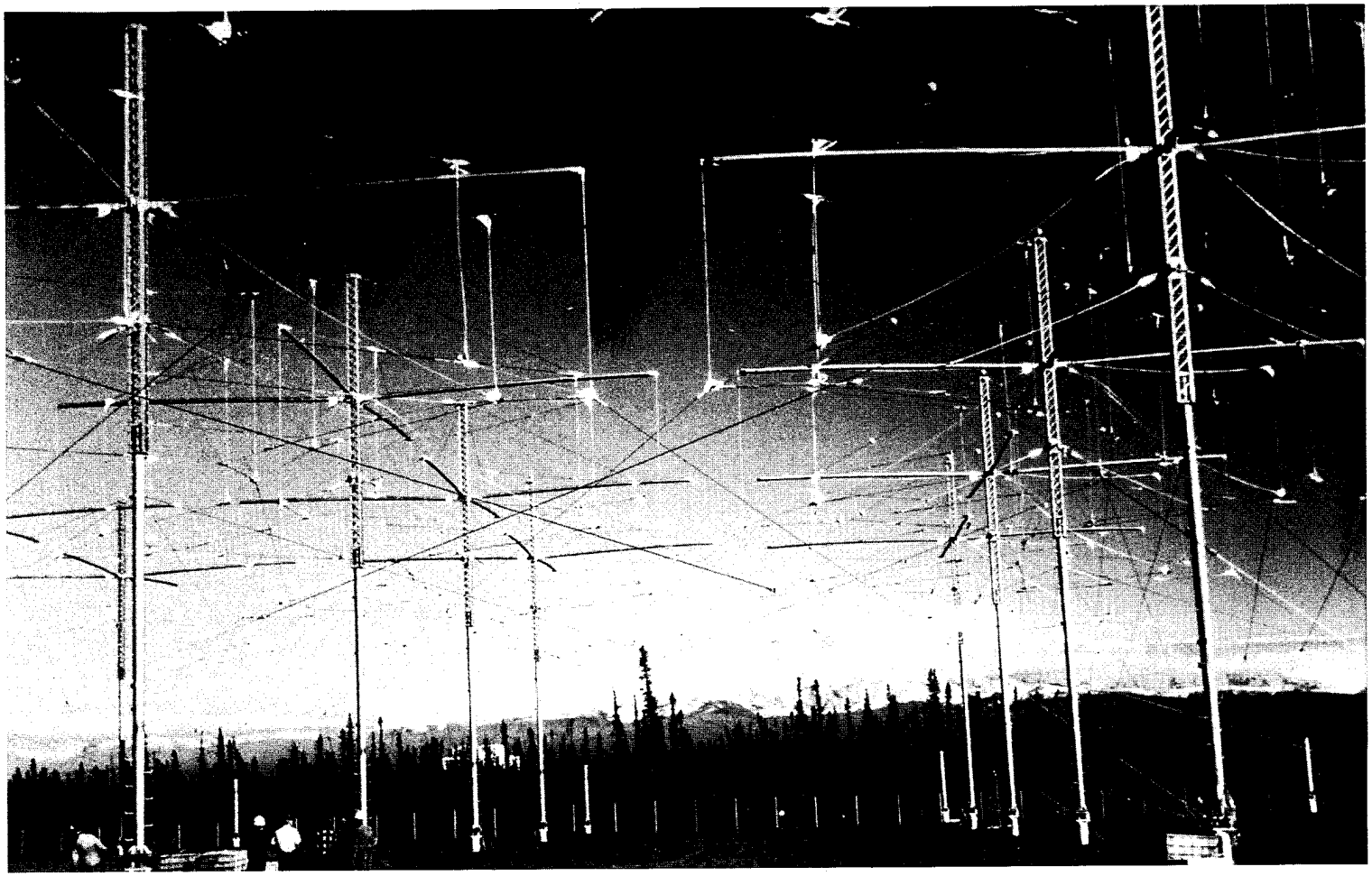
Jun 13 — The Geophysics Directorate received the news that the Air Force's POM submission for fiscal year 1996 zero-funded the 6.2 Project for Geophysics within PE 62601F, PE 63410F, and PE 63707F. The employee's union at Phillips Laboratory/Hanscom (NFFE) created a new SAVE Committee to work to reverse the decision on zero-funding.



The Photovoltaic Array Space Power Plus Diagnostics (PASP Plus) instrumentation shown as Orbital Sciences Corporation technicians integrated the twelve arrays and diagnostic sensors onto the APEX satellite bus prior to its successful launch into orbit.

Orbital Sciences Corp. Photo

27 Jun	The Atmospheric Density Satellite (ADS) sponsored by the Ionospheric Physics Division was lost as the result of a Pegasus XL launch vehicle failure.
Jul 7	Dr. Roth, Director of Geophysics, announced that Dr. Ed Cliver and Dr. Bamandas Basu had received Honorable Mentions in the Air Force Basic Research Award competition.
Jul 8	Senator Edward M. Kennedy visited the Geophysics Directorate to pledge his support in efforts to reverse the zero-funding of Geophysics.
Aug 3	The APEX satellite was successfully launched on a standard Pegasus booster from a B-52 aircraft. It carried the Directorate's Photovoltaic Array Space Power Plus Diagnostics (PASP Plus) experiment into an elliptical orbit reaching the inner radiation belt.
Aug 8	Brigadier Nelson de Souza Taveira, director of the Centro Technico Aerospacial of Brazil's Air Ministry, visited the Geophysics Directorate to discuss cooperative programs.
Aug 29	The Defense Meteorological Satellite Program launched its F12 satellite, which carried three Space Physics Division sensors, the SSIES-2, SSJ4, and SSM.
Sep 1	A Cooperative Research and Development Agreement (CRDA) was signed with Atmospheric and Environmental Research (AER), Inc. to develop and market products using the Directorate's Air Force Interactive Meteorological System (AIMS).
Sep 7	Senator Kennedy revisited the Geophysics Directorate to announce the restoration of the majority of its funding in the Air Force's fiscal year 1996 budget.
Sep 19	The Research Library began to implement a new library computer system. It will provide users immediate access via Telnet to a catalog of its book, audiocassette, and videotape holdings.
Sep 23	The Chief of Civilian Personnel at Hanscom announced that a voluntary civilian retirement and separation incentive had been approved for Hanscom AFB. The "window" was announced to be 3-28 October.
Nov	The development prototype of a new high-power, high-frequency radio transmitter located at Gakona, AK, was completed. The High Frequency Active Auroral Research Program (HAARP) is a joint venture of Phillips Laboratory's Ionospheric Effects Division and the Office of Naval Research.



The Development Prototype antenna array at the HAARP site at Gakona, Alaska

1995

Feb-Apr	The Aerospace Engineering Division of the Space Experiments Directorate completed a demonstration of test target vehicles for the Navy's LEAP (Lightweight Exo-Atmospheric Projectiles) Program.
Mar 24	The Defense Meteorological Satellite Program (DSMP) S13 satellite was launched successfully. It carried three space sensors built by the Space Physics Division, (SSIES-2, SSJ4, and SSM).
May 11	The Optical Environment Division's new Flying Infrared Signature Test Aircraft, FISTA II, an NKC-135E, completed its initial flight.
Spring	The Data Analysis Division completed the development and testing of the Midcourse Space Experiment (MSX) Data Analysis System, bringing it up to Initial Operating Capability.
Spring	The Space Physics Division installed a powerful workstation at the 50th Weather Squadron to process and display Solar Wind Interplanetary Measurements (SWIM) data taken by NASA's WIND satellite.
Jun 1	The Atmospheric Sciences Division's improved Weather Software for Night Vision Goggles went to the Air Force Special Operations Command for evaluation.
Jun	The Earth Sciences Division performed an integrated geophysical survey at a site that will be used for a series of ground remediation studies.
Jul 31	The Defense Satellite Communications System (DSCS) B-7 satellite was launched successfully. It carried a prototype version of the Charge Control System (CCS) for proof-of-concept testing.
Aug 15-16	GP management held an Offsite Meeting at Lincoln Laboratory.
Sep 6	The Directorate's Geo-Space Model, a 3-D model of solar-magnetospheric interactions, was installed for evaluation at the 50th Weather Squadron.
Sep 7	The Space Shuttle STS-69 mission was launched from Kennedy Space Center, carrying GP's CHAWS-2 experiment as part of NASA's WAKE SHIELD payload.
Sep 11-15	The Earth Sciences Division co-sponsored the 17th Annual International Symposium on Comprehensive Test Ban Treaty Monitoring. It was held in Scottdale, AZ.

Sep 13 A Workforce Picnic for the Geophysics and Electromagnetics Directorates was held in conjunction with their 50th Anniversary. Over 350 personnel from Phillips and Rome Laboratories at Hanscom attended.

Sep 14 The Geophysics and Electromagnetics Directorates celebrated the 50th. Anniversary of their founding. Tours of the directorates' facilities, the presentation of the Loeser Lecture, and a set of historical seminars were followed in the evening by a reception and banquet at the Crowne Plaza Hotel, Woburn, MA. More than 400 people attended the banquet. Several of those in attendance had worked at the original Cambridge Field Station in the late 1940s.

APPENDICES

Appendix A: Directors of the Phillips Laboratory, Geophysics Directorate and Commanders of its Predecessor Organizations, 1985-1995

Appendix B: Designations, Headquarters, and Commands, 1945-1995

Appendix C: Internal Organization of the Laboratory in 1990 and 1995

Appendix D: Laboratory Award Winners (Guenter Loeser, Marcus O'Day, Commander and Director, and Technology Management Awards), 1985-1995

Appendix A

DIRECTORS OF THE PHILLIPS LABORATORY, GEOPHYSICS DIRECTORATE AND COMMANDERS OF ITS PREDECESSOR ORGANIZATIONS, 1985-1995

Commanders
Air Force Geophysics Laboratory
1989 - 1990

Col Joseph C. Morgan, III	15 Jun 84 - 18 Jul 85
Col J. R. Johnson	18 Jul 85 - 7 Aug 87
Col John R. Kidd	7 Aug 87 - 24 Aug 89
Col Robert J. Hovde	24 Aug 89 - 13 Dec 90

Directors
Phillips Laboratory/Geophysics Directorate
1990 - Present

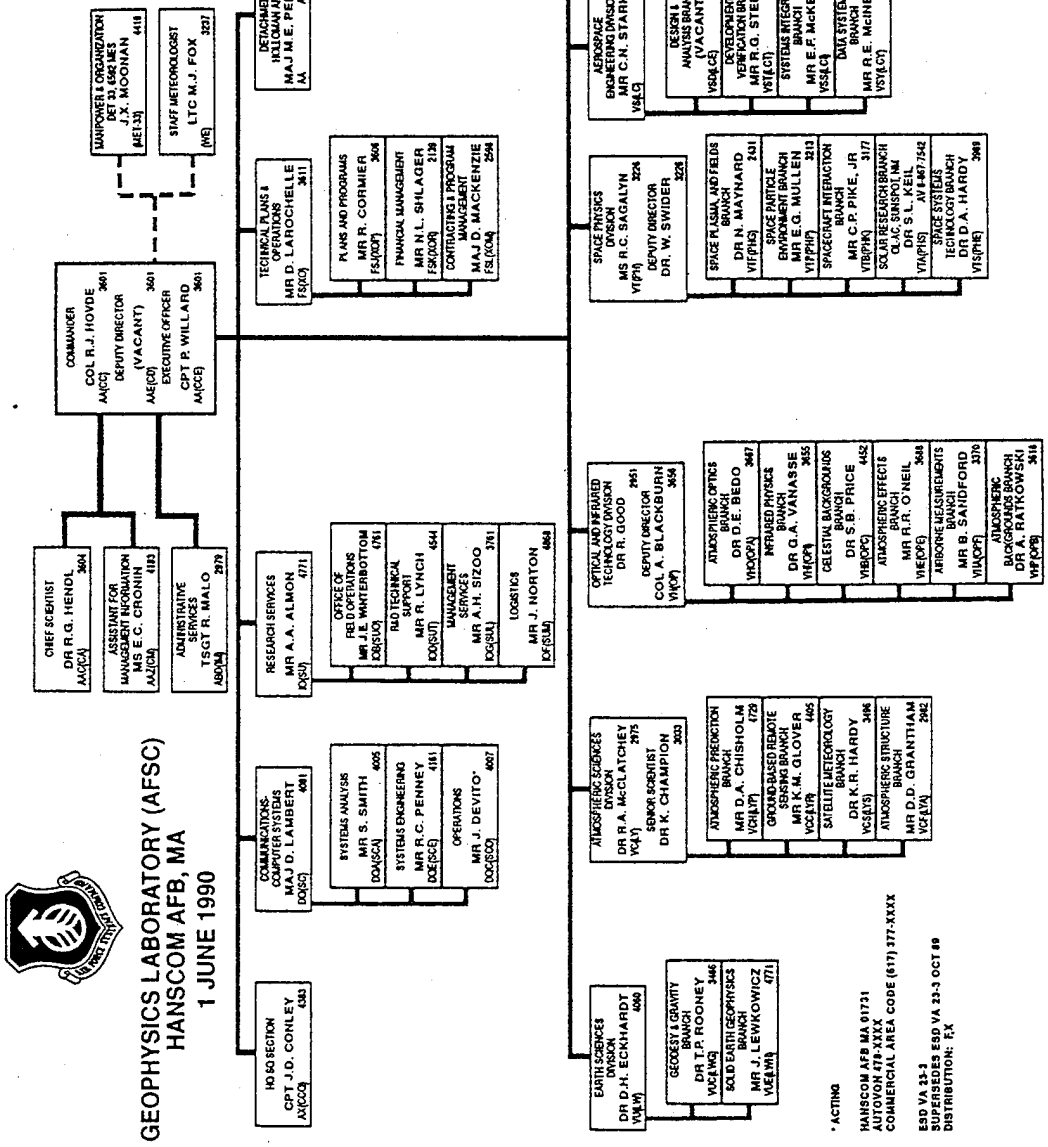
Col Robert J. Hovde	13 Dec 90 - 26 Jul 91
Dr. R. Earl Good	26 Jul 91 - 12 Aug 93
Dr. Harold Roth	12 Aug 93 - Present

DESIGNATIONS, HEADQUARTERS, AND COMMANDS
1945 - 1994

Designation	*Dates*	*Headquarters*	*Command*
Cambridge Field Station (CFS)	*20 September 1945 - 5 July 1949*	*Watson Laboratories Red Bank, N.J. 20 September 1945- 1 December 1947*	*Air Technical Service Command (in 1946 renamed the Air Materiel Command). 20 September 1945 - 2 April 1951*
Air Force Cambridge Research Laboratories (AFCRL)	*5 July 1949 - 28 June 1951*		
Air Force Cambridge Research Center (AFCRC)	*28 June 1951 - 2 May 1960*		*Air Research and Development Command (ARDC) 2 April 1951 - 1 April 1961*
Detachment 2, Hdqtrs. Air Force Research Div.(AFRD)	*2 May 1960 - 1 August 1960*	*Air Force Research Division*	
Air Force Cambridge Research Laboratories (AFCRL)	*1 August 1960 - 15 January 1976***		*Office of Aerospace Research (OAR)* 1 April 1961 - 1 July 1970*
		Director of Laboratories, 1 July 1970 - 1 Oct. 1982	*Air Force Systems Command (AFSC) 1 July 1970 - 30 June 1992*
Air Force Geophysics Laboratory (AFGL)	*15 January 1976 - 9 March 1989*		
		Space Technology Center 1 Oct. 1982 - 12 Dec 1990	
Geophysics Laboratory (GL)	*9 March 1989 - 12 December 1990*		
Geophysics Directorate (GP)	*13 December 1990 - Present*	*Phillips Laboratory 13 December 1990 - Present*	*Air Force Materiel Command (AFMC) 1 July 1992 - Present*

**The Office of Aerospace Research had command status and reported directly to Headquarters USAF.*
***Two Divisions of AFCRL were transferred to jurisdiction of the Rome Air Development Center (RADC) on 1 January 1976.*

Appendix C


GEOPHYSICS LABORATORY (AFSC)
HANSCOM AFB, MA
1 JUNE 1990
COMMANDER
COL R.J. HOYDE
DEPUTY DIRECTOR
(VACANT)
EXECUTIVE OFFICER
CPT P. WILLARD
CHIEF SCIENTIST
DR R.G. HENDL
ASSISTANT FOR MANAGEMENT INFORMATION
MS E.C. CRONIN
ADMINISTRATIVE SERVICES
TSGT R. MALO
MANPOWER & ORGANIZATION
DET 33, 6592 MES
J.X. MOONAN
STAFF METEOROLOGIST
LTC M.J. FOX
DETACHMENT 1
HOLLOMAN AFB, NM
MAJ M.E. PERSHING
TECHNICAL PLANS & OPERATIONS
MR D. LAROCHELLE
PLANS AND PROGRAMS
MR R. CORMIER
FINANCIAL MANAGEMENT
MR N.L. SHLAGER
CONTRACTING & PROGRAM MANAGEMENT
MAJ D. MACKENZIE
HQ SQ SECTION
CPT J.D. CONLEY
RESEARCH SERVICES
MR A.A. ALMON
OFFICE OF FIELD OPERATIONS
MR J.E. WHITTENBOTTOM
R&D TECHNICAL SUPPORT
MR R. LYNCH
MANAGEMENT SERVICES
MR A.H. SIZOO
LOGISTICS
MR J. NORTON
COMMUNICATIONS-COMPUTER SYSTEMS
MAJ D. LAMBERT
SYSTEMS ANALYSIS
MR S. SMITH
SYSTEMS ENGINEERING
MR R.C. PENNEY
OPERATIONS
MR J. DEVITO*
ATMOSPHERIC SCIENCES DIVISION
DR R.A. McCLATCHEY
SENIOR SCIENTIST
DR K. CHAMPION
ATMOSPHERIC PREDICTION BRANCH
MR D.A. CHISHOLM
GROUND-BASED REMOTE SENSING BRANCH
MR K.M. GLOVER
SATELLITE METEOROLOGY BRANCH
DR K.R. HARDY
ATMOSPHERIC STRUCTURE BRANCH
MR D.D. GRANTHAM
EARTH SCIENCES DIVISION
DR D.H. ECKHARDT
GEODESY & GRAVITY BRANCH
DR T.P. ROONEY
SOLID EARTH GEOPHYSICS BRANCH
MR J. LEWKOWICZ
OPTICAL AND INFRARED TECHNOLOGY DIVISION
DR R. GOOD
DEPUTY DIRECTOR
COL A. BLACKBURN
ATMOSPHERIC OPTICS BRANCH
DR D.E. BEDO
INFRARED PHYSICS BRANCH
DR G.A. VANASSE
CELESTIAL BACKGROUNDS BRANCH
DR S.B. PRICE
ATMOSPHERIC EFFECTS BRANCH
MR R.R. O'NEIL
AIRBORNE MEASUREMENTS BRANCH
MR B. SANDFORD
ATMOSPHERIC BACKGROUNDS BRANCH
DR A. RATKOWSKI
SPACE PHYSICS DIVISION
MS R.C. SAGALYN
DEPUTY DIRECTOR
DR. W. SWIDER
SPACE PLASMA AND FIELDS BRANCH
DR N. MAYNARD
SPACE PARTICLE ENVIRONMENT BRANCH
MR E.G. MULLEN
SPACECRAFT INTERACTION BRANCH
MR C.P. PIKE, JR
SOLAR RESEARCH BRANCH
OLAC SUNSPOT, NM
DR S.L. KEIL
SPACE SYSTEMS TECHNOLOGY BRANCH
DR D.A. HARDY
AEROSPACE ENGINEERING DIVISION
MR C.N. STARK
DESIGN & ANALYSIS BRANCH
(VACANT)
DEVELOPMENT & VERIFICATION BRANCH
MR R.G. STEEVES
SYSTEMS INTEGRATION BRANCH
MR E.F. McKENNA
DATA SYSTEMS BRANCH
MR R.E. McINERNEY
IONOSPHERIC PHYSICS DIVISION
MR R.A. SKRIVANEK
DEPUTY DIRECTOR
DR H. CARLSON
IONOSPHERIC INTERACTIONS BRANCH
MR J. RASMUSSEN
IONOSPHERIC MODELING AND REMOTE SENSING BRANCH
DR D.N. ANDERSON
IONOSPHERIC EFFECTS BRANCH
MR W.K. VICKERY
* ACTING
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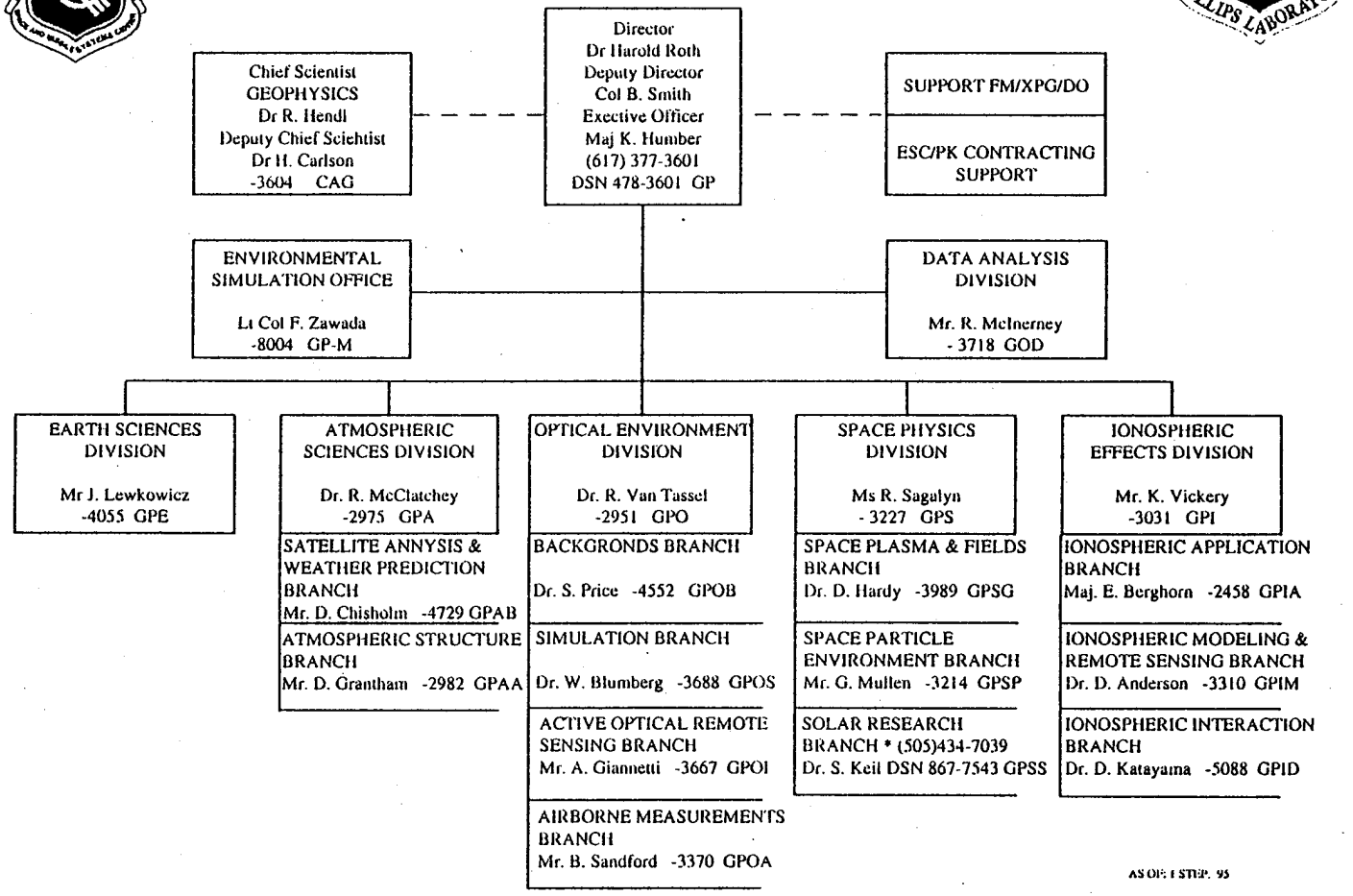
DIRECTORATE OF GEOPHYSICS



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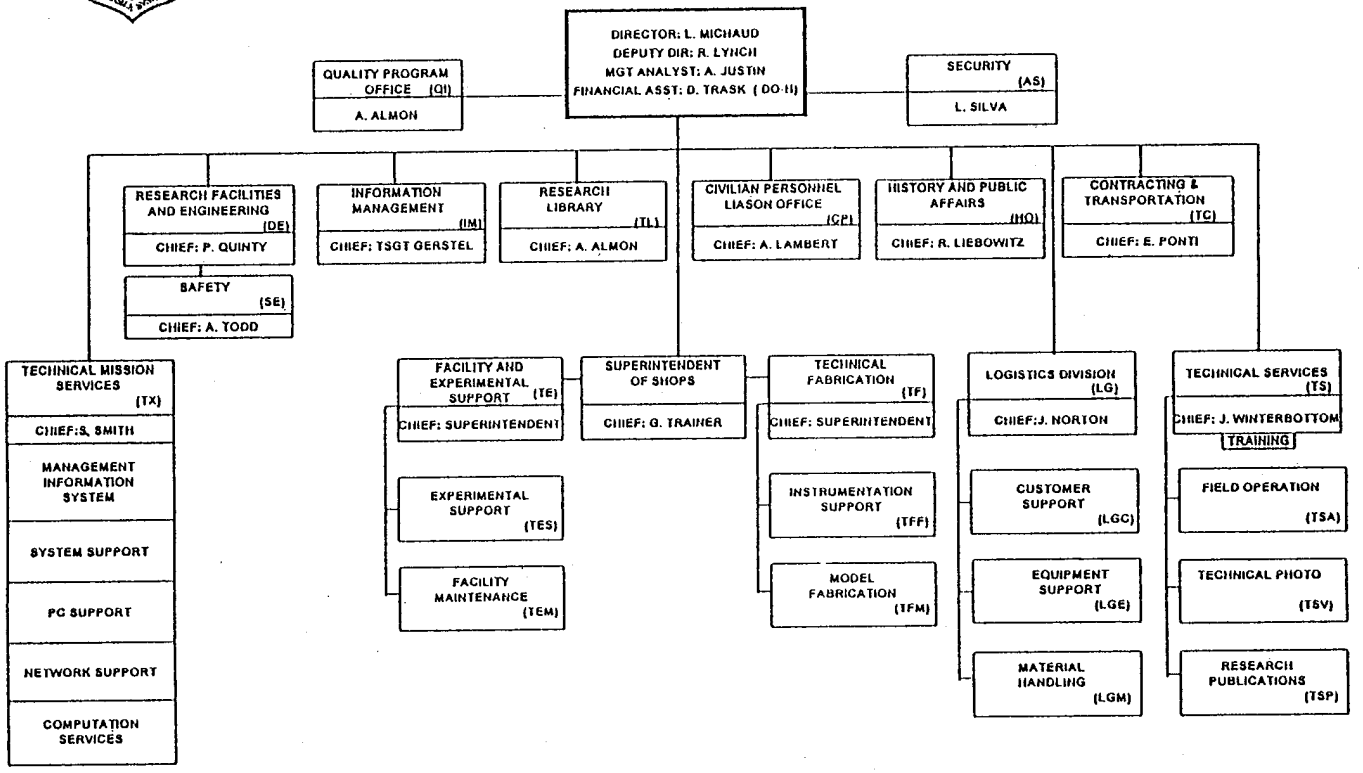
OPERATIONS AND SUPPORT



AS OF: JULY 25, 1995

Appendix D

GEOPHYSICS DIRECTORATE AWARDS
1985 - 1995

Guenter Loeser Memorial Award Winners

This award for scientific achievement has been given out annually since 1955. It was created to honor the memory of Dr. Guenter Loeser, a meteorologist at the Air Force Cambridge Research Center. Dr. Loeser was killed in a helicopter crash in Nebraska while conducting the Great Plains Turbulence Field Program.

The award is given for an outstanding research contribution, and its recipient presents a lecture on a topic of scientific interest.

1985	Mr. Don Smart Ms. Margaret Ann Shea
1986	Dr. John F. Paulson
1987	Dr. David A. Hardy
1988	Dr. William J. Burke
1989	*
1990	Dr. Herbert C. Carlson
1991	Dr. Nelson C. Maynard
1992	Dr. Donald Neidig
1993	Mr. John A. Klobuchar
1994	Dr. M. Susan Gussenhoven
1995	Mr. E. Gary Mullen

* In 1990 a decision was made to have all the awards be presented in the same calendar year. Although no award is listed for 1989, awards were given for every year with no omission.

Marcus O'Day Award Winners

This scientific award has been given out annually since 1962. It was created to honor the memory of Dr. Marcus O'Day, a scientist at the Cambridge Field Station and the Air Force Cambridge Research Center between 1945 and 1961. Dr. O'Day, a physicist by training, worked in a number of areas including electronics, upper air research, and studies relating to the exploding wire phenomenon.

After Dr. O'Day's death in 1961, the award was established to recognize an "outstanding achievement published in a recognized scientific journal" during the previous year.

1985	Dr. Edward J. Weber Mr. Jurgen Buchau Mr. James G. Moore Dr. J.R. Sharber Dr. B.W. Reinisch Mr. R. C. Livingston Dr. J. David Winningham
1986	Dr. M. Susan Gussenhoven Dr. David A. Hardy Mr. Ernest Holeman
1987	Dr. John R. Jasperse Dr. Bamandas Basu

Marcus O'Day Award Winners (cont.)

1988	Mr. Robert d'Entremont
	Larry W. Thomason
1989	Dr. Donald H. Eckhardt
	Dr. Christopher Jekeli
	Dr. Andrew R. Lazarewicz
	Mr. Anestis J. Romaides
	SMSgt Roger W. Sands
1990	Dr. Edward J. Weber
	Dr. Herbert C. Carlson
	Dr. Santimay Basu
	Dr. John O. Ballenthin
	Dr. David A. Hardy
	Dr. Michael Smiddy
	Dr. Nelson C. Maynard
1991	Dr. Gregory Ginet
	Dr. Michael A. Heinemann
1992	Mr. Edward G. Mullen
	Dr. M. Susan Gussenhoven
	Lt Kevin Ray
	Lt Michael Violet
1993	Dr. Albert A. Viggiano
	Dr. Robert A. Morris
	Dr. John F. Paulson
1994	Dr. Ramesh Sharma
1995	Dr. Rainer Dressler
	Dr. Edmond Murad

Commander's and Director's Award Winners

This award was instituted in 1971 to give recognition for distinguished service to AFGL as an organization. It is awarded for "managerial or administrative contributions, engineering or logistic efforts, and support for major field undertakings."

Commander's Award

1985	Mr. Patrick J. Windward
1986	Mr. Vito J. Conte
1987	Mr. Jack R. Griffin
1988	Mr. John W. Armstrong
1989	Ms. Patricia Bench
1990	Mr. Maurice A. Aubrey
1991	Mr. Arthur Giannetti

Director's Award

1992	Mr. Alan R. Griffin
1993	Mr. William Sullivan
1994	Ms. Celeste R. Gannon
1995	TSgt Leonard Butilier

Technology Management Award Winners

1987	Mr. Brian P. Sandford	1992	Mr. Richard M. Nadile
1988	Mr. Edward G. Mullen	1993	No nomination
1989	*	1994	Mr. Paul I. Tattelman
1990	Dr. Michael Kraus	1995	Dr. David A. Hardy
1991	Mr. Charles C. Pike		

* In 1990 a decision was made to have all the awards be presented in the same calendar year. Although no award is listed for 1989, awards were given for every year with no omission.